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1953 SESSION OF SCIENTIFIC COUNCIL, CENTRAL ORDER OF LENIN INSTITUTE OF HEMATOLOGY AND BLOOD TRANSFUSION

Cand Med Sci I. I. Zaretskiy [Moscow]

An All-Union Scientific Session on Problems of Hematology and Blood Transfusion is held annually. The 31st Extended Plenary Session of the Scientific Council, Central Order of Lenin Institute of Hematology and Blood Transfusion, was held at the end of May 1953. Representative workers of scientific and practical medicine as well as of related branches of science from 17 cities of all republics of the USSR participated in the session. The program of the session was devoted to the newest theoretical and practical achievements in the field of hematology and blood transfusion. This program embraced a great number of very urgent problems and was directed toward the solution of immediate problems of public health.

The reports presented at the meeting discussed concrete results in the following fields: hematherapy of various pathological conditions, blood substitutes and parenteral protein nutrition, hemopoiesis under normal and pathological conditions, and organization of the blood-transfusion service.

Prof A. A. Bagdasarov, Corresponding Member of the Academy of Medical Sciences USSR, director of the Central Order of Lenin Institute of Hematology and Blood Transfusion, opened the session with an introductory address in which he reviewed the basic results of the work done during the immediately preceding period. He indicated the shortcomings in this work and outlined the path for subsequent creative development in connection with problems having theoretical, practical, and organizational significance.

One may note with satisfaction that in recent times new successes have been achieved in the field of hematology and blood transfusion. The organization of scientific research on the basis of the theories of Botkin, Sechenov, and Pavlov and of creative Soviet biology in general has contributed to these successes.

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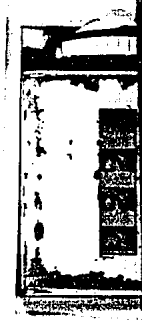

On the basis of convincing experimental data, the leading role of the central nervous system in producing the biological aspects of the effects of blood transfusion has been demonstrated by N. A. Fedorov, I. I. Fedorov, G. D. Gaibov, and others. As a result of the investigations which have been conducted, it was established that the primary and principal factor in all processes taking place in the organism subsequently to blood transfusion are changes in the functional condition of the higher divisions of the central nervous system. On the basis of many-sided investigations carried out by a number of scientists, functional shifts in the cortical and subcortical areas of the cerebrum must be regarded as apparently connected with both automatic irritation and irritation through the agency of the vascular receptors. One must recognize that these investigations are of great significance for the creation of a contemporary, methodologically correct theory explaining the mechanism of effects produced by blood transfusion. Achievements in this field open up new rational methods for prophylaxis and for elimination of posttransfusion complications.

The report of Prof A N. Bakulev, Active Member of the Academy of Medical Sciences USSR, was heard with great interest. This report presented new data on the role and proper place of blood transfusion and of the transfusion of blood components in preparation for surgical operations as well as in the treatment during the operational and postoperational periods. Bakulev emphasized the necessity of continuing our detailed research on defining the problem more precisely in regard to the optimum dosage in transfusions, the number of transfusions to be carried out, and the method to be applied.

Prof F E. Efendiyev (Baku) presented new and important data on the application of blood transfusions against the background of a vagocarotid block, as a means of averting shock after major surgical interferences in the thoracic and abdominal regions

The problems of blood transfusion and of the transfusion of blood components in the surgical treatment both of disturbances of the hemopoietic system and of chronic osteomyelitis were discussed in interesting papers by M. D. Patsiora and A. G. Fedoteyev. The results achieved open new possibilities for the effective therapy of the pathological conditions involved.

Of particular significance are problems connected with the application of blood transfusion and of the transfusion of blood components in combination with various pharmacologically active agents which exert an influence on nerve mechanisms. This subject has been discussed in a report presented by Prof M. S. Dul'tsin. Dul'tsin and his collaborators established that when pharmacological agents are used to alleviate the posttransfusion reaction, definite changes take place in the functional condition of organs and of systems active in the organism. In some cases, these agents produce a positive effect. For instance, medium doses of bromine exert a pronounced action on the prothrombin-forming function of the liver. In other cases, physiologically active agents produce a negative effect. Administration of pantopon and atropine may be accompanied in some cases by a reduction of the filtering capacity of the kidneys. Thus, a discriminating approach to the administration of pharmacological agents in combination with blood transfusions is necessary.

A. N. Nikitin (Vologda), Honorary Physician of the Republic, described successful application of intra-arterial blood transfusions in combating terminal conditions [agony?] and clinical death. The work of R. M. Glants (Khar'kov) and others represents an interesting attempt to establish the significance of internal secretion as an intermediate link in the transmission of the influence of the cortex on functions of various organs and systems of organs during blood transfusion. M. G. Ishanova and A. Yu. Tilis (Tashkent) successfully applied in the clinic the method of plethysmography in order to investigate the effects of blood transfusion on vascular reactions in patients suffering from gastrointestinal ulcers. In extensive many-sided investigations conducted by pathophysiologists, pathological anatomists, and clinicists of the Order of Lenin Institute

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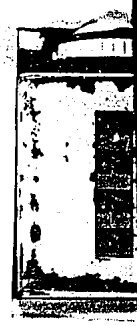

of Hemotology and Blood Transfusion, important data have been obtained which have bearing on the most intimate mechanisms of posttransfusion changes in the activity of the kidneys. Of the greatest interest is the thorough pathohistological analysis of renal changes skillfully carried out by N. S. Rozanova.

In a paper by N. E. Messineva, experimental data have been presented on blood decomposition which occurs in connection with the transfusion of blood that has been kept for various periods of time. The blood decomposition was studied according to indexes of bile pigment metabolism through application of an original method of joining the bile outlet with the urine outlet devised by Prof N. A. Fedorov. Biochemical and colloid-chemical investigations carried out during a number of years have culminated in a well-developed theory of the preservation of blood and of blood components (S. M. Severin, P. S. Vasil'yev, and others).

Work on the problem of blood preservation is being actively pursued along several lines. Work on the development of new preservative solutions, more active antiseptics, and blood stabilizers has been successfully conducted. The beneficial effects of polyalcohols (F. G. Ginzburg) and of quinine on the keeping properties of preserved blood (M. O. Ravshenbakh and D. M. Grozdov) have been demonstrated. The achievements of modern chemical research have enabled us to launch investigations on the preservation of blood without the use of stabilizers. It is known that stabilizers have a deleterious effect on the preservation of blood cells and that they reduce the therapeutic effectiveness of blood transfusions. Investigations along these lines have led to the development of an entirely new method of blood preservation (A. A. Bagdasarov, F. R. Vinogad-Finkel', and B. A. Putterg). Experience has shown that blood prepared by this method approaches, in biological value, blood introduced by direct transfusion from a donor. Preservation of blood without a stabilizer permits us to obtain the leucocytic mass for use as a new transfusion agent, the application of which in therapeutic practice may be indicated in some cases.

Formulas have been evolved which make it possible to add, to preserved blood, alcohol and other drugs which contribute to protective-therapeutic inhibition (I. I. Fedorov). Work on the development of more effective conditions for the storage and transportation of blood has been carried out. Of great importance are investigations on problems dealing with blood substitutes; therapeutic preparations of blood, and parenteral protein nutrition. These investigations have led to undoubted successes in obtaining plasma in its original condition, dry plasma, dry serum, liquids serving as blood substitutes, and various therapeutic blood preparations.

New data are available which testify to the therapeutic effectiveness of serum and plasma saturated with hemoglobin, vitamins, antibiotics, and hypnotics. The method and equipment for the drying of plasma have been considerably perfected. Good results have been obtained in work on the creation of new synthetic plasma substitutes and blood styptics. Of great practical importance are anti-shock liquids prepared from dry serum and plasma, which have been proposed and investigated by A. A. Bagdasarov, D. M. Grozdov, and G. Ya. Rozenberg.

The problem of parenteral protein nutrition has been discussed in detail. The principal report on this problem was given by Prof N. A. Fedorov. Fedorov presented a considerable amount of data dealing with investigation of the physiological effect produced by the action of new heteroprotein preparations. These preparations are devoid of toxic and anaphylactogenic properties. Fedorov demonstrated convincingly that heteroproteins are assimilated very efficiently under appropriate conditions. He also stated that, when a combination of the measures proposed by him is applied, it is possible to preserve, for a long period, the life of an animal which is in a state of profound dystrophy.

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A special meeting was devoted to problems pertaining to plasma substitute solutions prepared on the basis of heteroprotein. Of particular interest was the report of Prof A. A. Fedorovskiy (Kiev), in which the nature of pathogenetic mechanisms of the action produced by the transfusion of heterosera was considered on the basis of extensive clinical experience. Fedorovskiy's communication is of great interest from the methodological standpoint and also by reason of the fact that the author has advanced the question in regard to wider application of heterosera in the complex therapy of a number of surgical conditions.

In a number of papers (those by D. M. Grozdov, Ya. A. Spasokukotskiy, V. A. Belitser, K. I. Katkova, G. K. Goedash, S. I. Didenko, A. A. Ushakova, A. G. Fedotenkov, and others) definitive results of clinical experimental investigations dealing with the action of species-nonspecific serum were presented. There can be no doubt that these liquids exert a positive therapeutic effect in various pathological conditions, particularly when dehydration of the body, various intoxications, or hypoproteinemia are present. At the same time, many investigators established with certainty that species-nonspecific serum is not devoid of anaphylactogenic properties and that on repeated introduction of species-nonspecific serum, reactions of various degrees of severity arise. In connection with this, it is necessary to apply all available prophylactic measures for desensibilization and, what is most important, to call the attention of clinicists to the necessity of administering species-nonspecific serum in a suitable manner.

One should like to express the assurance that the investigators who have developed species-nonspecific serum will do everything possible to perfect the technology of the production of this preparation in such a manner that residual anaphylactogenecity will be entirely eliminated.

In the field of hematological problems, the continuing investigations on the physiology and pathophysiology of hemopoiesis, which are being conducted on the basis of I. P. Pavlov's theory of higher nervous activity, are of great scientific and practical significance for clinical application. New facts on the role of the cortex and of other divisions of the central and peripheral nervous system in the regulation of hemopoiesis under normal and pathological conditions have been accumulated. Work on this subject has been done by V. N. Chernigovskiy, N. A. Fedorov, N. S. Dzhavadyan, N. S. Rozanova, E. I. Terent'yeva, M. O. Raushenbakh, Ye. I. Charova, M. I. Garfunkel', and others.

A report by A. M. Nametkheba and M. G. Yakhtel'dze presented extensive experimental data on the study of a factor which stimulates hemopoiesis and is contained in the gastric juice of dogs. These investigators evolved and applied a new method for the quantitative determination of the hemostimulating activity of gastric juice. For the first time, the dependence of the formation of this juice on the functional condition of the central and peripheral nervous system was established.

One may hope that theoretical and practical hematology will be enriched in the near future by data on the significance of the nervous system in the etiology and pathogenesis of diseases of blood-forming organs. This data will permit the devising of methods for the efficient treatment of such diseases. We may note that considerable success has been achieved in the therapy of a number of hematological diseases. In the treatment of Biermer's disease [pernicious anemia] and of macrocytic anemias, a new preparation has been proposed which is of great practical significance. The new preparation exerts a more effective action on hemopoiesis processes than kampion

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Various methods for the application of hemotransfusion agents and complex methods of iron therapy are being developed and differentiated indications for their application are being established (M. A. Dul'tsin). A system of therapy of hemolytic anemias by plasma transfusions has been developed and is being widely applied (Kh. Kh. Vlados and A. P. Belonosov). An effective complex method for the therapy of erythremias with radioactive phosphorus combined with bloodletting and subsequent introduction of plasma has been proposed (Kh. Kh. Vlados, N. V. Ratmirova, and A. P. Belonosov).

Of great interest is the communication of Prof Ye. A. Vost, who has demonstrated the reversibility of hypoplastic processes and has proposed new ways for the rational therapy of the conditions involved. Also of interest are experimental data which testify to the significance of the nervous system in the origination and development of spontaneous and induced leukoses (M.O. Raushenbakh and Ye. I. Zharova).

At a special meeting, representatives of local institutes and blood-transfusion stations exchanged information on the subject of organizational work. More extensive introduction of blood transfusion, transfusion of blood components, and transfusion of blood fractions into therapeutic practice were emphasized. The number of interrayon and rayon departments of blood transfusion attached to hospitals has increased. The quality of preserved blood has improved. Many stations are more actively participating in scientific research work. There is progress in the preparation of personnel trained in blood-preservation and transfusion techniques.

The reports presented at the plenary session and the extensive discussions in connection with these reports brought out a number of important problems which require immediate solution. Prof A. A. Bagdasarov emphasized, with a great deal of justification, the necessity of devoting more attention to the investigation of functional interrelationships between the cerebral cortex and internal organs under conditions which exist in connection with blood transfusion. It is necessary to introduce more extensively into medical practice the newest clinical-physiological methods for the investigation of the activity of higher divisions of the central nervous system. These methods will play a decisive role in the development of a modern theory explaining the mechanism of the action of blood transfusion. At this time, it is essential to extend our knowledge of problems pertaining to metabolic processes and the functional condition of various organs and systems.

The totality of these investigations will permit the broadening of the indications for the application of blood transfusion or the transfusion of its components and will define more precisely the role and significance of blood transfusion in the system of the complex therapy of various diseases. One must also bear in mind the necessity of a solution of this problem in relation to the following pathological conditions: traumatic shock, surgical shock, shock due to burns, severe blood losses, postoperative septic infections, infectious diseases, and diseases of the liver and kidneys.

No less important are problems connected with the further theoretical and practical development of new, more effective methods of blood preservation. In this connection, the most important task is completion of the development of and introduction into practice of the new method of blood preservation which has been proposed by the Central and Leningrad Institutes of Blood Transfusion.

It is important to pay constant attention to the wide introduction of newly developed, effective blood substitutes and antishock solutions into therapeutic practice. The most pressing task is extension of organized work on the elimination of anaphylactogenic and toxogenic properties of heteroprotein. One must apply the maximum effort in order to obtain effective blood substitutes and antishock solutions in the dry state.

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One must note that the cardinal problems of the pathogenesis and therapy of hematological diseases have not yet received an appropriate experimental solution. In connection with this, the most immediate task will be the creation of experimental biological models of diseases of the blood system, as well as development, on this basis, of extensive experimental therapy. Under clinical conditions, one must devote principal attention to the investigation of leucoses, aplastic anemias, and agranulocytic reactions. One must recognize that problems of the pathogenesis of these diseases are being studied with adequate consideration of the significance of the nervous system and of various humoral mechanisms closely connected with the nervous system.

In closing the plenary session, Prof A. A. Bagdasarov noted that the past year was one of creative development in scientific research work. There can be no doubt that the plenary session will contribute to the exchange of information as well as to wide extension and strengthening of cooperative activities of scientific and practical collectives engaged in work on problems pertaining to hematology and blood transfusion.

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